

1, 6, 13, 17, 19, 22, 24, 26, and 30 have been amended, as follows:

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1. (Twice Amended) A power supply system, comprising:

$\beta^1$  a controller configured to cause a regulator to produce a principle supply voltage and a secondary supply voltage, said regulator for coupling to a power source and to a microelectronics device to supply said principal supply voltage and said secondary supply voltage to said microelectronics device,

wherein said controller is further configured to maintain said principal supply voltage within a tolerance level bounded at a principal supply upper limit by a first reliability voltage value and bounded at a principal supply lower limit by a second reliability voltage value, and to maintain said secondary supply voltage within a second tolerance level bounded at a secondary supply upper limit by the first reliability voltage value and bounded at a secondary supply lower limit by a third reliability voltage value and said first reliability voltage value, said first reliability voltage is determined by multiplying one plus a tolerance level by a first input voltage required value.

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6. (Twice Amended) A power supply system, comprising:

$\beta^2$  a controller configured to cause a regulator to produce a principal supply voltage and a secondary supply voltage, said regulator for coupling to a power source and to a microelectronics device to supply said principal supply voltage and said secondary supply voltage to said microelectronics device,

wherein said controller is further configured to maintain said principal supply voltage within a tolerance level bounded at a principal supply upper limit by a first reliability voltage value and bounded at a principal supply lower limit by

a second reliability voltage value, and to maintain said secondary supply voltage within a second tolerance level bounded at a secondary supply upper limit by the first reliability voltage value and bounded at a secondary supply lower limit by a third reliability voltage value, and

the principal supply voltage and the secondary supply voltage are determined in accordance with a voltage-current loadline and said controller is further configured to determine said gain factor in order to produce the principal supply voltage and the secondary supply voltage according to said voltage-current loadline and said voltage-current loadline specifies a non-linear relationship and said non-linear loadline further includes a discontinuity corresponding to an immediate current value between zero and a maximum.

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13. (Twice Amended) A regulator, comprising:

a plurality of regulator circuits for coupling to a microelectronics device to provide a plurality of regulated input voltages to said microelectronics device, the plurality of regulated input voltages being maintained within an input voltage range bounded at an upper limit by a first reliability voltage value, the first reliability voltage value determined by multiplying a first one of the plurality of regulated input voltages by the sum of one and a tolerance level, wherein each regulator circuit provides a particular one of said plurality of regulated input voltages to said microelectronics device,

wherein each said regulator circuit further includes:

a controller including a comparator and a threshold detector, an input of said comparator being coupled to the output of said threshold detector,

a switch coupled to said controller and operating in response to a signal provided

by said controller, said switch connected to an inductor, a diode, and an output capacitor arranged in a network that produces a load current in response to an input source voltage received via said switch, and

133 a current sense feedback network connected to said network output and having a gain factor, said feedback network coupled to said threshold detector to cause said threshold detector to produce an output signal as a product of said gain factor,

wherein said controller is configured to produce one of said plurality of regulated input voltages by varying the duty cycle of said switch in accordance with a voltage current loadline,

wherein said controller is further configured to maintain said one of said plurality of regulated input voltages within an input voltage range bounded at a lower limit, and

wherein said lower limit for said one of said plurality of regulated input voltages is computed by said controller in order to maintain said one of said plurality of regulated input voltages in accordance with said voltage-current loadline of said one of said plurality of regulated input voltages for different values of said load current.

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17. (Twice Amended) A regulator, comprising:

134 at least two regulator circuits, each said regulator circuit for coupling to a microelectronics device to provide a plurality of regulated input voltages to said microelectronics device, wherein each said regulator circuit provides a particular one of said regulated input voltages to said microelectronics device,

wherein each said regulator circuit further includes:

a controller including a comparator and a threshold detector, an input of said comparator being coupled to the output of said threshold detector,

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a switch coupled to said controller and operating in response to a signal provided by said controller, said switch connected to an inductor, a diode, and an output capacitor arranged in a network that produces a load current in response to an input source voltage received via said switch, and

a current sense feedback network connected to said network output and having a gain factor, said feedback network coupled to said threshold detector to cause said threshold detector to produce an output signal as a product of said gain factor,

wherein said controller is configured to produce one of said plurality of said regulated input voltages by varying the duty cycle of said switch in accordance with a voltage current loadline,

wherein said controller is further configured to maintain said one of regulated input voltages within an input voltage range bounded [by a constant] at an upper limit by a first reliability voltage value and bounded at a lower limit, and

wherein said lower limit for said one of said plurality of regulated input voltages is computed by said controller in order to maintain said one of said plurality of regulated input voltages in accordance with said voltage-current loadline of said one of said plurality of regulated input voltages for different values of said load current and said voltage-current loadline specifies a non-linear relationship.

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19. (Twice Amended) An electronic system, comprising:

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a microelectronics device having at least two input voltage required values to receive at least two input supply voltages;

a regulator coupled to said microelectronics device; and

a power source coupled to said regulator,

wherein said regulator is configured to produce said at least two supply voltages within an input voltage range bounded by an upper limit and a lower limit,

$\beta^5$  wherein said upper limit of each of said at least two input supply voltages is a first reliability voltage value, said first reliability voltage value is determined by multiplying one plus a tolerance level by a first input voltage required value, and

wherein said lower limit of each of said at least two input supply voltages is determined by one minus a tolerance level multiplied by each of said at least two input supply voltage required values.

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$\beta^6$  22. (Twice Amended) The electronic system of claim 19, wherein said regulator is further configured to determine said gain factor for each of said at least two input supply voltages according to a voltage-current loadline, and wherein said lower limit for each of said at least two input supply voltages is equal to [the product of] one minus a tolerance level multiplied by a corresponding one of the at least two input supply voltage required values.

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$\beta^7$  24. (Twice Amended) An electronic system, comprising:  
a microelectronics device having at least two input voltage required values to receive at least two input supply voltages;  
a regulator coupled to said microelectronics device; and  
a power source coupled to said regulator,  
wherein said regulator is configured to produce said at least two supply voltages within an input voltage range bounded by an upper limit and a lower limit, and  
wherein said upper limit of each of said at least two input supply voltages is a first reliability voltage value; said lower limit of each of said at least two input supply

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voltages is determined by a gain factor multiplied by each of said at least two input supply voltage required values, and said regulator adjusts said gain factor to produce said at least two input supply voltages according to a voltage-current loadline, and wherein said loadline specifies a non-linear relationship.

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26. (Twice Amended) A regulating method, comprising:

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supplying multiple input voltages to one or more microelectronics devices, each of said multiple input voltages including a corresponding input voltage required value;

determining an upper limit of the voltage regulation range for all of said multiple input voltages by multiplying a first corresponding input voltage required value by a sum of one plus a tolerance level;

determining a lower limit of a voltage regulation range for said multiple input voltages in accordance with a corresponding voltage-current loadline; and

maintaining each of said multiple input voltages supplied to said microelectronics devices above said lower limit of said voltage regulation range and under said first reliability voltage.

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30. (Twice Amended) A regulating method, comprising:

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supplying multiple input voltages to one or more microelectronics devices, each of said multiple input voltages including a corresponding input voltage required value;

determining a lower limit of a voltage regulation range for said multiple input voltages in accordance with a corresponding voltage-current loadline; and

maintaining each of said multiple input voltages supplied to said microelectronics devices above said lower limit of said voltage regulation range and under said first reliability voltage,

wherein said determining further includes selecting a gain factor in order to produce said multiple input voltages according to said corresponding voltage-current loadline, adjusting a gain factor as required to produce said multiple input voltages according to said corresponding voltage-current loadline, where said voltage-current loadline specifies a non-linear relationship, and said lower limit is equal to the product of one minus a tolerance level multiplied by said corresponding input voltage required value.

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